Center Independent Research & Development: GSFC IRAD

Upgrade of the HIWRAP Ka-band Transceiver

Completed Technology Project (2011 - 2012)

Project Introduction

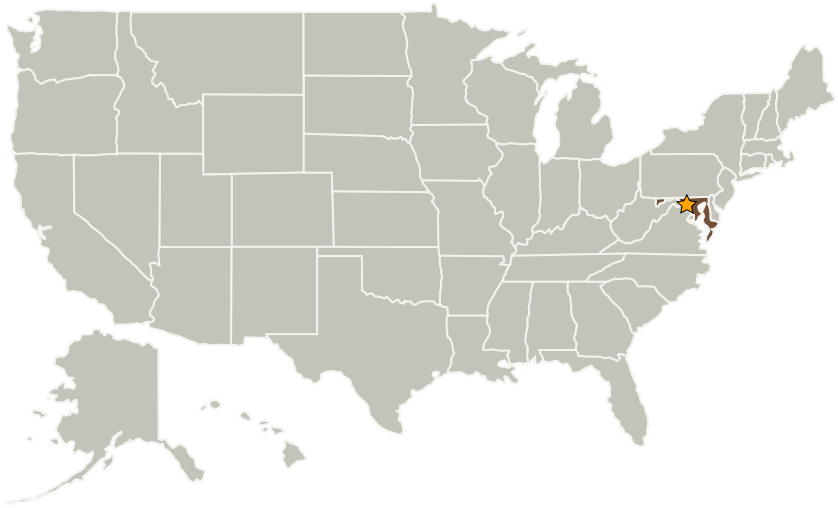
This proposed effort seeks to upgrade the Ka-band (35 GHz) transceiver of the GSFC High-altitude Imaging Wind and Rain Airborne Profiler (HIWRAP) radar so that it can be paired with another GSFC W-band (94 GHz) Cloud Radar System (CRS) as an airborne simulator for the Decadal Survey Aerosol Cloud Ecosystem (ACE) spaceborne radar. The technical objective is to utilize cutting-edge high efficient solid state power amplifier and low loss front-end to improve the HIWRAP Ka-band system performance.

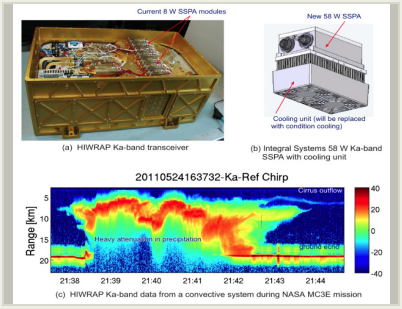
Utilizing cutting-edge high power solid state power amplifier and low loss front-end components to improve system sensitivity. Leveraging the SSPA technology that has been developed for the GPM DC3R Ka-band radar. Using high speed switching technique on the SSPA bias voltage to improve the power efficiency, reduce heat dissipation and reduce thermal noise. Maximize the usage of the current HIWRAP Ka-band transceiver hardware. Lab test and evaluation, then aircraft integration. Collaborators: Gerry Heymsfield

Anticipated Benefits

N/A

Primary U.S. Work Locations and Key Partners





Project Image Upgrade of the HIWRAP Ka-band Transceiver

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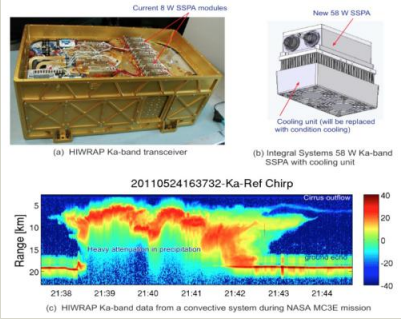
Organizations Performing Work	Role	Type	Location
★Goddard Space Flight Center(GSFC)	Lead Organization	NASA Center	Greenbelt, Maryland

Primary U.S. Work Locations
Maryland

Images



5276.jpg
Project Image Upgrade of the HIWRAP Ka-band Transceiver
(https://techport.nasa.gov/image/1331)

Links

GSC-16512-1
(https://ntts.arc.nasa.gov/app/)

Project Website:

http://sciences.gsfc.nasa.gov/sed/

Organizational Responsibility

Responsible Mission Directorate:
Mission Support Directorate (MSD)

Lead Center / Facility:
Goddard Space Flight Center (GSFC)

Responsible Program:
Center Independent Research & Development: GSFC IRAD

Project Management

Program Manager:
Peter M Hughes

Project Manager:
Matt Mcgill

Principal Investigator:
Lihua Li

Co-Investigator:
Gerald M Heymsfield

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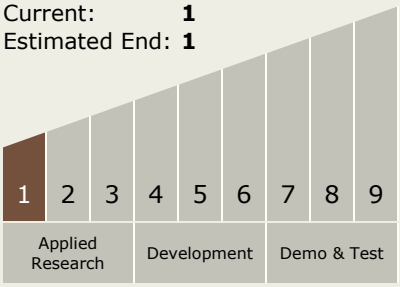
Completed Technology Project (2011 - 2012)

Technology Maturity (TRL)

Start: **1**
Current: **1**
Estimated End: **1**



Technology Areas

Primary:

- TX05 Communications, Navigation, and Orbital Debris Tracking and Characterization Systems
  - TX05.2 Radio Frequency
    - TX05.2.2 Power-Efficiency